MITSUBISHI POWER

LSSVL12D Servo valve interface module

LS communication LVDT Servo valve interface

■Summary

＊Terminal block input / output unit
- ・Digital input : 2
- ・Valve position demand output : 1
- ・LVDT input / output : 1 (6/4/3 Line type)

＊Auxiliary output connector
- ・Analog output : 3

＊Panel I/O connector
- ・Connector dropout detection DI : 1
- ・Digital input / output : 5 / 3
- ・Analog input / Input and output : Input (Fixing) 3 / Input and output (variable) 3
  Input and output (variable) Setting pattern:
  In internal logic four types can be set

＊USB connector : 1 (For maintenance communication mini-B)

■Overview Specifications

ITEM	SPECIFICATION
Digital input (52 G ON/ External forced closed input)	DC 24 V × 2, minimum ON Current 2 mA
Valve position demand output	±20 mA / ±60 mA × 1
LVDT input / output	6/4/3 Line type × 1, Output: 5 to 8 Vrms, Frequency: 800 to 8000 Hz, Input: Less than 8 Vrms
Analog output (Auxiliary output connector)	1 to 5 V DC × 3
Digital input (Panel I/O)	DC 24 V × 5, Minimum ON current 2 mA Connector dropout detection DI × 1
Digital output (Panel I/O)	Open collector output × 3 , Maximum voltage DC 30 V, Maximum load current 0.1 A
Analog input / Input and output (Panel I/O)	1 to 5 V DC × 3 / 1 to 5 V DC × 3 (Switchable input / output by the internal logic setting)
Indicator	Display LED × 4: Run / Status / Network status A / Network status B Channel State LED × 16: Ch 1 to Ch 16 Arbitrarily set by internal logic
USB connector	For maintenance communication mini-B × 1
Self-diagnostic functions	Power voltage check, Clock check, Heartbeat check, CRC check
IDOL Implementation	Possible
Module Duplication	Supported (backplane uses LSIOB02 or LSIOB03) However, the signals of the auxiliary output connector and panel I/O connector are not duplicated
Dielectric strength	AC 1500 V Digital input / output terminal - PE Between AC 1000 V Analog input / output terminal - PE Between AC 1000 V LVDT input / output terminal - PE Between
Environmental conditions	Ambient temperature (Operating / Storage) -5 to 60°C Ambient humidity (Operating / Storage) 0 to 95% RH (No condensation)
Operating power supply	DC 24 V ±20% Dual power reception (The voltage supplied from the backplane)
Shock / Vibration	15 G 11 ms / 3.5 mm @5 to 8.4 Hz, 1G @8.4 to 150 Hz
Dimensions	152.5 mm (D) x 94 mm (H) x 46 mm (W) (Except projection)

DIASYS Netmation®
DIASYS Netmation 4S®

MOVE THE WORLD FORW>RD MITSUBISHI HEAVY INDUSTRIES GROUP

Mitsubishi Power is a power solutions brand of Mitsubishi Heavy Industries.

CGS-S6506-E-13 (2023. 07. 31)
SL : 1 ECT : N/A

MITSUBISHI POWER

LSSVL12D Servo valve interface module

LS communication LVDT Servo valve interface

■Details Specifications

ITEM					SPECIFICATION	
Terminal block Input/output section	Ch 1: 52 G ON Digital input	Number of channels			1	
		Insulation method			Photocoupler insulation	
		Dielectric strength			AC 1500 V Digital input terminal - PE Between	
		Current range	ON current		DC 2 mA or more External power supply voltage: DC 24 V ±10%	
			OFF current		DC 1 mA or less	
	Ch 2: External forced closed input	Number of channels			1	
		Insulation method			Photocoupler insulation	
		Dielectric strength			AC 1500 V Digital input terminal - PE Between	
		Current range	ON current		DC 2 mA or more Sense supply voltage: DC 24 V ±10%	
			OFF current		Less than DC 1 mA	
	Ch 3,Ch 4: Valve position demand output *The type of 01/02 is switched by EMS	Number of channels			1	
		Insulation method			Digital isolator insulation	
		Dielectric strength			AC 1000 V Analog output terminal - PE Between	
		Rated output current			01 type	-20 to +20 mA (full scale)
					02 type	-60 to +60 mA (full scale)
		Load resistance range			01 type	40 to 400 Ω
					02 type	10 to 160 Ω
		Absolute precision		@25°C	01 type	±0.1% FS (±0.04 mA) @Calibration load (Factory shipped: 250 Ω)
					02 type	±0.1% FS (±0.12 mA) @Calibration load (Factory shipped: 40 Ω)
		Temperature drift		@-5 to 60°C	01 type 02 type	±100 ppm/°C (Against full scale)
		Output current monitor			Built-in	
			Absolute precision	@25°C	01 type	±0.3% FS (±0.12 mA) @Calibration load
					02 type	±0.3% FS (±0.36 mA) @Calibration load
			Temperature drift	@-5 to 60°C	01 type 02 type	±200 ppm/°C (Against full scale)
	Ch 7: LVDT primary output *Output voltage and output frequency can be changed by internal logic setting	Number of channels			1	
		Insulation method			Digital isolator insulation, Photocoupler insulation	
		Dielectric strength			AC 1000 V Analog output terminal - PE Between	
		Excitation output voltage			5 to 8 V rms (Variable according to internal logic setting)	
		Excitation output frequency			800 to 8000 Hz (Variable according to internal logic setting)	
		Output voltage accuracy	Absolute precision	@25°C	±0.2% 230 Ω(at 5 kHz), @300 Ω(at 1 kHz)	
			Temperature drift	@-5 to 60°C	±200 ppm/°C	
		Output frequency accuracy	Absolute precision	@25°C	±1%	
			Temperature drift	@-5 to 60°C	±200 ppm/°C	
		Drive minimum coil impedance			120 Ω	
		Output voltage monitor			Built-in	
			Absolute precision	@25°C	±0.3% FS (full scale: 5 to 8 Vms [Internal logic setting value])	
			Temperature drift	@-5 to 60°C	±200 ppm/°C (Against full scale)	
	Ch 8, Ch 9: LVDT secondary input *The detection method of the effective value detection/synchronous (With or without phase correction) detection can be selected (Set by internal logic)	Number of channels			2	
		Insulation method			Digital isolator insulation, Photocoupler insulation	
		Dielectric strength			AC 1000 V Analog input terminal - PE Between	
		Rated input voltage			Less than 8 Vrms	
		Input voltage accuracy	Absolute precision	@25°C	±0.3% FS (full scale: 8 Vms)	
			Temperature drift	@-5 to 60°C	±200 ppm/°C (Against full scale)	

MITSUBISHI POWER

LSSVL12D Servo valve interface module

LS communication LVDT Servo valve interface

ITEM				SPECIFICATION
Auxiliary output connector	Analog output	Number of channels		3
		Insulation method		Digital isolator insulation
		Dielectric strength		AC 500 V Analog output terminal – PE Between
		Rated output voltage		1 to 5 V (full scale)
		Minimum load resistance		2 kΩ
		Absolute precision	@25°C	±0.3% FS (±12 mV)
		Temperature drift	@–5 to 60°C	±200 ppm/°C (Against full scale)
Panel I / O connector	Digital input	Number of channels		DI (External power supply): 5 Connector dropout detection DI × 1
		Insulation method		Photocoupler insulation
		Dielectric strength		AC 500 V Digital input terminal – PE Between
		Current range	ON current	DC 2 mA or more External power supply voltage: DC 24 V ±10%
			OFF current	Less than DC 1 mA
	Digital output	Number of channels		3
		Insulation method		Photocoupler insulation
		Dielectric strength		AC 500 V Digital output terminal – PE Between
		Maximum applied voltage		DC 30 V
		Maximum load current		0.1 A
		Leakage current at OFF		Less than 0.1 mA
		Maximum residual voltage when ON		DC 1.0 V @100 mA
	Analog input	Number of channels		3 (AI#1 to #3 in the Block diagram)
		Insulation method		Digital isolator insulation
		Dielectric strength		AC 500 V Analog input terminal – PE Between
		Rated input voltage		1 to 5 V (full scale)
		Input impedance		100 kΩ or more
		Absolute precision	@25°C	±0.3% FS (±12mV)
		Temperature drift	@–5 to 60°C	±200 ppm/°C (Against full scale)
	Analog input/output	Number of channels		3 (AI#4 to #6/AO#1 to #3 in the Block diagram)
	①When the analog input selection	Insulation method		Digital isolator insulation
		Dielectric strength		AC 500 V Analog input / output terminal – PE Between
		Rated output voltage		1 to 5 V (full scale)
		Input impedance		100 kΩ or more
		Absolute precision	@25°C	±0.3% FS (±12 mV)
		Temperature drift	@–5 to 60°C	±200 ppm/°C (Against full scale)
	②When the analog output selection	Insulation method		Digital isolator insulation
		Dielectric strength		AC 500 V Analog input / output terminal – PE Between
		Rated output voltage		1 to 5 V (full scale)
		Minimum load resistance		9 kΩ
		Absolute precision	@25°C	±0.3% FS (±12mV)
		Temperature drift	@–5 to 60°C	±200 ppm/°C (Against full scale)
		Output voltage monitor		1 to 5 V
	(AI / AO can be switched by internal logic setting)	Remarks		When used as an analog output, AI#4 to #6 of the analog MCU in the block diagram becomes the read back of AO#1 to #3. Panel IO terminals AI#4/AO#1, AI#5/AO#2, and AI#6/AO#3 can be set with the following combinations. (The table below shows 2-bit representation of 4 ways 00 to 11 using two point numbers of internal logic)

Internal logic (Number used as AO) / Terminal name			AI#4 / AO#1	AI#5 / AO#2	AI#6 / AO#3	Pattern
Number used as AO (Decimal number)	DO1 (Binary number)	DO2 (Binary number)				
0	0	0	AI	AI	AI	3 inputs / 0 output (Factory setting)
1	0	1	AI	AI	AO	2 inputs / 1 output
2	1	0	AI	AO	AO	1 inputs / 2 outputs
3	1	1	AO	AO	AO	0 inputs / 3 outputs

Operation cycle usable in DPS		10 msec or more
Communication specification between IOA	Communication method , communication speed	LVDS, 100 Mbps

DIASYS Netmation®

DIASYS Netmation 4S®

MOVE THE WORLD FORW>RD MITSUBISHI HEAVY INDUSTRIES GROUP

Mitsubishi Power is a power solutions brand of Mitsubishi Heavy Industries.

MITSUBISHI POWER

LSSVL12D Servo valve interface module

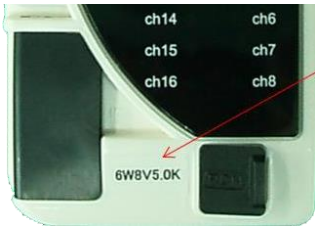
LS communication LVDT Servo valve interface

ITEM		SPECIFICATION
Self-diagnostic functions		Power voltage check (24 V, 17 V, 3.3 V, 1.2 V, Other) *Refer to block diagram Clock check (FPGA-MCU , FPGA-CPU) Heartbeat check (FPGA-MCU , FPGA-CPU) CRC check (FPGA-MCU)
IDOL Implementation		Possible Supplement: IDOL is the logic description language used in DIASYS-UP, DIASYS-UP/V. The internal logic of this module is described in IDOL.
Module Duplication		Supported (backplane uses LSIOB02 or LSIOB03) However, the signals of the auxiliary output connector and panel I/O connector are not duplicated
Protective function (Backplane supply power protection)		Overvoltage protection, Overcurrent protection
Indicator	Display LED	4: RUN (Run)/STS (Status)/NSA (Network status A)/NSB (Network status B)
	Channel State LED	16: Ch 1 to Ch 16 Arbitrarily set by internal logic
Serial interface	For maintenance	1: USB Serial (USB mini-B connector)
Hot swap		Possible
Operating power supply		DC 24 V ±20% Dual power reception (The voltage supplied from the backplane)
Environmental conditions	Module ambient temperature	(Operating / Storage) -5 to 60°C
	Module ambient humidity	(Operating / Storage) 0 to 95% RH (No condensation)
Vibration		3.5 mm @5 to 8.4 Hz 1 G @8.4 to 150 Hz
Shock		15 G 11 ms
Current consumption		Less than 350 mA
Weight		0.24 kg
Dimensions		152.5 mm (D) x 94 mm (H) x 46mm (W) (Except projection)
Standard/Directive		EN61131-2:2007, RoHS

About compliant module type

For compliant backplane of this product, please refer to " Compliant backplane list (CGS-S9901-E-XX) ".

For compliant accessory connector of this product, please refer to " Compliant accessory connector list (CGS-S9902-E-XX) ".



(Caution) This module may have different setting values.
A label ("4W8V 1.0K/5", etc) on the front of the module indicates the setting value.
When replacing, do not use the module with different setting value.

Example: How to read the label

4W 8V 1.0K / 5

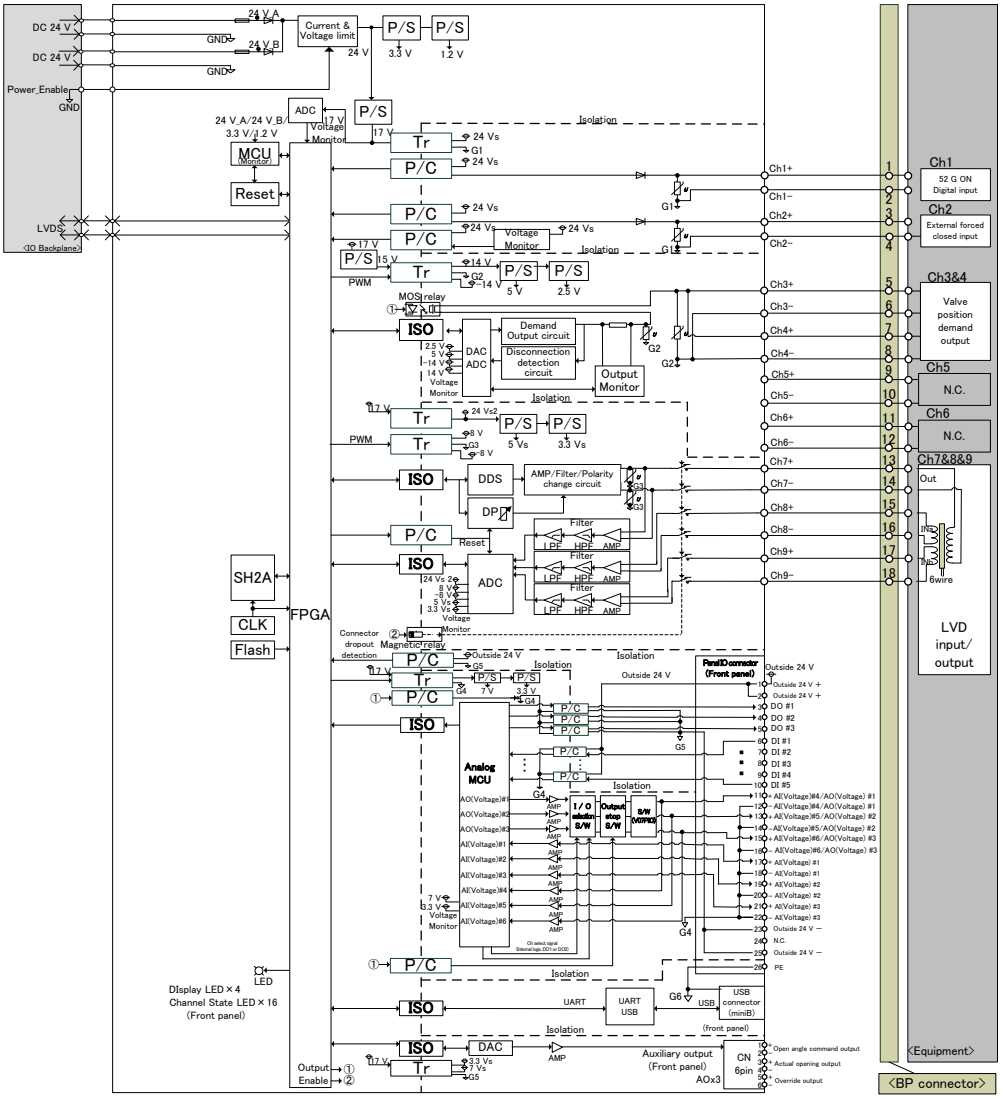
- 5 — Computing cycle HS (ms)
- 1.0K — Position detection (LVDT) Excitation frequency (kHz)
- 8V — Position detection (LVDT) Excitation voltage (Vrms)
- 4W — Position detection (LVDT) Wire Type

MITSUBISHI POWER

LSSVL12D Servo valve interface module

LS communication LVDT Servo valve interface

■Block diagram



P/S	:	Power supply	MCU	:	Micro control unit
SH2A	:	Renesas SH-2A micro processor	FPGA	:	Field programmable gate array
CLK	:	Clock generation circuit	LED	:	Light emitting diode
ISO	:	Digital isolator	ADC	:	Analog digital converter
LPF	:	Low pass filter	GND,G1,G2,G3,G4,G5,G6	:	Ground
LVDS	:	Low Voltage Differential Signaling	BP	:	Backplane
DP	:	Digital potentio meter	DDS	:	Direct digital synthesizer
PWM	:	Pulse width modulation	DAC	:	Digital analog converter
AMP	:	Amplifier	HPF	:	High pass filter
P/C	:	Photo Coupler	Tr	:	Transformer
N.C	:	No Connection	CN	:	Connector
AO	:	Analog Output	Flash	:	Flash ROM
PE	:	Protective Earth	MOS relay	:	Photo Metal-Oxide-Semiconductor relay
	:	Varistor		:	Resistor
	:	Fuse		:	Diode

DIASYS Netmation®
DIASYS Netmation4S®

MOVE THE WORLD FORW>RD MITSUBISHI HEAVY INDUSTRIES GROUP

Mitsubishi Power is a power solutions brand of Mitsubishi Heavy Industries.

CGS-S6506-E-13 (2023.07.31)